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**PATENT**  
Attorney Docket No. 023070-114881US  
Client Ref. No.: 90-008-5

On \_\_\_\_\_

TOWNSEND and TOWNSEND and CREW LLP

By: \_\_\_\_\_

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

Carol J. Lovatt

Application No.: Not Yet Assigned

Filed:

For: NOVEL FORMULATION OF  
PHOSPHORUS FERTILIZER FOR  
PLANTS

Examiner: Langel, W.

Art Unit: 1754

**DECLARATION OF JOHN PETERSON  
UNDER 37 C.F.R. §1.132**

Assistant Commissioner for Patents  
Washington, D.C. 20231

I, John L. Peterson, being duly warned that willful false statements and the like are punishable by fine or imprisonment or both (18 U.S.C. § 1001), and may jeopardize the validity of the patent application or any patent issuing thereon, state and declare as follows:

1. All statements herein made of my own knowledge are true, and statements made on information or belief are believed to be true and correct.

2. I received a bachelor of science in chemistry from California State University at Fresno in 1973. I am currently the vice president of manufacturing at Biagro

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Western Sales and have been at this position and positions as a chemist for 24 years. See attached Exhibit A.

3. I have read the patent application entitled "Novel Formulation of Phosphorus Fertilizer for Plants" and am familiar with the material contained therein. This declaration is provided to demonstrate that one of skill in the art can determine the metes and bounds of the invention as claimed and practice the invention according to the specification without undue experimentation. In particular, this declaration is provided to demonstrate that the specification describes the fertilizers of the present invention in terms of available phosphorus in an amount equivalent to a  $P_2O_5$  concentration in weight / volume, and that the mathematical conversion of a weight / volume concentration of  $P_2O_5$  into a weight / volume concentration of a phosphorous-containing acid (such as  $H_3PO_3$ ), a salt of a phosphorous-containing acid, or a phosphite, is a routine calculation that is well understood and frequently used in the art.

4. Conventionally, fertilizers are labeled to indicate available nutrients by three successive numbers that represent nitrogen, phosphorus, and potassium, in this order, in the amounts equivalent to the weight percentages of N,  $P_2O_5$ , and  $K_2O$ . For example, a 10-20-15 fertilizer contains nutrients equivalent to 10% of N, 20% of  $P_2O_5$ , and 15% of  $K_2O$  in weight / weight. Although the nutrients do not actually exist in a fertilizer in the forms of N,  $P_2O_5$ , or  $K_2O$ , these species are used as reference measures due to historic reasons.

5. In the present application, examples of fertilizer formulations are provided (Examples 1-9). They are labeled in three successive numbers, such as 0-40-0 or 0-30-0. While these numbers do represent the three nutrients in equivalent concentrations of N,  $P_2O_5$ , and  $K_2O$ , respectively, the concentrations are reflected in weight / volume percentages instead of weight / weight percentages.

6. For instance, in Example 2, 3.86 lbs of  $\text{H}_3\text{PO}_3$  and 0.5 lb of citric acid are made into one gallon of liquid fertilizer, which is labeled as a 0-40-0 fertilizer. The weight / volume (kg/L) concentration of  $\text{H}_3\text{PO}_3$  is thus:

$$(3.86 \text{ lbs} \times 0.454 \text{ kg/lb}) \div (1 \text{ gallon} \times 3.785 \text{ L/gallon}) = 0.46 \text{ (kg/L)}$$

In order to convert available amount of phosphorus in the form of  $\text{H}_3\text{PO}_3$  concentration to the form of  $\text{P}_2\text{O}_5$  concentration, one must begin with the molecular weight of these two molecules. The atomic weight for phosphorus is 30.97 grams per mole, hydrogen 1.01 g/mole, and oxygen 15.99 g/mole. The molecular weight for  $\text{H}_3\text{PO}_3$  is thus 81.97 g/mole and  $\text{P}_2\text{O}_5$  141.89 g/mole. Since there is one atom of phosphorus in every molecule of  $\text{H}_3\text{PO}_3$  and there are two atoms of phosphorus in every molecule of  $\text{P}_2\text{O}_5$ , same amount of phosphorus thus exists in 1 mole of  $\text{H}_3\text{PO}_3$  and  $\frac{1}{2}$  mole of  $\text{P}_2\text{O}_5$ , i.e., in 81.97 grams of  $\text{H}_3\text{PO}_3$  and 71.945 grams of  $\text{P}_2\text{O}_5$ . Therefore, to convert a weight / volume concentration ( $\text{H}_3\text{PO}_3$ ) into a weight / volume concentration ( $\text{P}_2\text{O}_5$ ), the following calculation is necessary:

$$\text{W/V} (\text{P}_2\text{O}_5) = \text{W/V} (\text{H}_3\text{PO}_3) \times 71.945 \div 81.97$$

When  $\text{W/V} (\text{H}_3\text{PO}_3) = 0.46 \text{ kg/L}$ ,  $\text{W/V} (\text{P}_2\text{O}_5) = 0.46 \times 71.945 \div 81.97 = 0.40 \text{ (kg/L)}$ , or 40% (kg/L) W/V. This percentage corresponds to the label of "0-40-0 fertilizer."

Using Example 6 as a second example to illustrate the same point, 2.89 lbs of  $\text{H}_3\text{PO}_3$ , 2.99 lbs of KOH, and 0.84 of lb citric acid are included in a one gallon liquid fertilizer labeled as 0-30-30.

$$\begin{aligned} \text{W/V} (\text{P}_2\text{O}_5) &= \text{W/V} (\text{H}_3\text{PO}_3) \times 71.945 \div 81.97 \\ &= (2.89 \text{ lbs} \times 0.454 \text{ kg/lb}) \div (1 \text{ gallon} \times 3.785 \text{ L/gallon}) \times 71.945 \div 81.97 \\ &= 0.30 \text{ (kg/L) or 30% (kg/L) W/V} \end{aligned}$$

This percentage again corresponds to the label of "0-30-30 fertilizer."

Further, the concentration of KOH in weight / volume in this example can be just as easily converted into concentration of K<sub>2</sub>O in weight / volume. The atomic weight of K is 39.10, thus molecular weight of KOH is 56.10 g/mole and K<sub>2</sub>O 94.19 g/mole. Since there is one atom of potassium in every molecule of KOH and there are two atoms of potassium in every molecule of K<sub>2</sub>O, there is equal amount of potassium in 1 mole of KOH and ½ mole of K<sub>2</sub>O, i.e., in 56.10 grams of KOH and 47.095 grams of K<sub>2</sub>O. Therefore,

$$\begin{aligned} W/V (K_2O) &= W/V (KOH) \times 47.095 \div 56.10 \\ &= (2.99 \text{ lbs} \times 0.454 \text{ kg/lb}) \div (1 \text{ gallon} \times 3.785 \text{ L/gallon}) \times 47.095 \div 56.10 \\ &= 0.30 \text{ (kg/L) or 30% (kg/L) W/V} \end{aligned}$$

This percentage also corresponds to the label of "0-30-30 fertilizer."

It is thus clear that a person with ordinary skill in the art is able to recognize, based on the volume of the fertilizers and weight of H<sub>3</sub>PO<sub>3</sub> in the fertilizers, that the fertilizer labels in the examples of the specification refer to P<sub>2</sub>O<sub>5</sub> concentration in weight / volume percentage and not in weight / weight percentage.

7. The conversion principle described in Paragraph 6 allows simple mathematical conversion of an H<sub>3</sub>PO<sub>3</sub> concentration in weight / volume to an equivalent P<sub>2</sub>O<sub>5</sub> concentration in weight / volume, which is routine for those skilled in the art. Hence, when a fertilizer of the present invention is described in terms of P<sub>2</sub>O<sub>5</sub> weight / volume concentration to reflect the amount of phosphorus contributed by H<sub>3</sub>PO<sub>3</sub>, one skilled in the art can routinely prepare the fertilizer by introducing a proper amount of H<sub>3</sub>PO<sub>3</sub> into the fertilizer mixture. There is no need for any experimentation.

8. Furthermore, the same conversion principle allows one skilled in the art to calculate the appropriate amount of any given phosphorous-containing species, regardless

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whether it is a phosphorous-containing acid, a phosphorous-containing salt (i.e., a phosphite), or any other phosphorous-containing species, to be introduced into a fertilizer mixture, when the amount of phosphorus contributed by this phosphorous-containing species is described in terms of  $P_2O_5$  weight / volume concentration.

9. In view of the foregoing, it is my scientific opinion that one of ordinary skill in the art will be able to understand the subject matter of the claimed invention and practice the invention through routine calculations.

Date: September 24, 2002

By: John L. Peterson  
John L. Peterson

SF 1371637 v1

DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled A NOVEL FORMULATION OF PHOSPHORUS FERTILIZER FOR PLANTS, the specification of which

(check  one)  is attached hereto.

was filed on 7 February 1994 as  
Application Serial No. 08/192,508  
and was amended on \_\_\_\_\_

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Patent Office all information known to me to be material to patentability as defined in 37 C.F.R. 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

| (Number) | (Country) | (Day/Month/Year Filed) |
|----------|-----------|------------------------|
| _____    | _____     | _____                  |
| _____    | _____     | _____                  |
| _____    | _____     | _____                  |

Priority Claimed

| Yes                      | No                       |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
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| <input type="checkbox"/> | <input type="checkbox"/> |

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose to the Patent Office all information known to me to be material to patentability as defined in 37 C.F.R. 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

(Application Serial No.)

(Filing Date)

(Status)

(patented, pending, abandoned)

I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: Harold C. Hohbach, Reg. No. 17,757; Aldo J. Test, Reg. No. 18,048; Thomas O. Herbert, Reg. No. 18,612; Donald N. MacIntosh, Reg. No. 20,316; Jerry G. Wright, Reg. No. 20,165; Edward S. Wright, Reg. No. 24,903; David J. Brezner, Reg. No. 24,774; Richard E. Backus, Reg. No. 22,701; James A. Sheridan, Reg. No. 25,435; Robert B. Chickering, Reg. No. 24,286; Gary S. Williams, Reg. No. 31,066; Richard F. Trecartin, Reg. No. 31,801; C. Michael Zimmerman, Reg. No. 20,451; Walter H. Dreger, Reg. No. 24,190; Steven F. Caserza, Reg. No. 29,780; Jan P. Brunelle, Reg. No. 35,081

provided that if any one of said attorneys ceases being affiliated with the law firm of Flehr, Hohbach, Test, Albritton & Herbert as partner, employee or of counsel, such attorney's appointment as attorney and all powers derived therefrom shall terminate on the date such attorney ceases being so affiliated.

Direct all telephone calls to Walter H. Dreger at (415) 781-1989.

Address all correspondence to:

FLEHR, HOHBACH, TEST,  
ALBRITTON & HERBERT  
Suite 3400, Four Embarcadero Center  
San Francisco, California 94111

File No. A-58141/WHD

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, §1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or  
first inventor:

Carol J. LOVATT

Inventor's signature:

X Carol J. Lovatt Carol J. Lovatt

Date:

X 2 May 1994

Residence:

X Riverside, CA 92506

Citizenship:

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X 1551 Kyle Court

X Riverside, CA 92506 - 6417

Full name of second joint  
inventor, if any:

\_\_\_\_\_

Inventor's signature:

\_\_\_\_\_

Date:

\_\_\_\_\_

Residence:

\_\_\_\_\_

Citizenship:

\_\_\_\_\_

Post Office Address:

\_\_\_\_\_

DECLARATION AND POWER OF ATTORNEY  
FOR PATENT APPLICATION

REVOCATION OF POWER OF  
ATTORNEY OR  
AUTHORIZATION OF AGENT

|                        |                  |
|------------------------|------------------|
| Application Number     | 10/341,968       |
| Filing Date            | January 13, 2002 |
| First Named Inventor   | Lovatt, Carol J. |
| Art Unit               | 1754             |
| Examiner Name          | Langel, W.       |
| Attorney Docket Number | 023070-114880US  |

I hereby revoke all previous powers of attorney or authorizations of agent given in the above-identified application:

A Power of Attorney or Authorization of Agent is submitted herewith.

OR

Please change the correspondence address for the above-identified application to:

Customer Number



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OR

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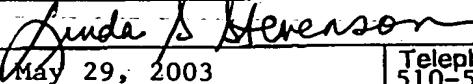
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I am the:

Applicant/Inventor.

Assignee of record of the entire interest. See 37 CFR 3.71.  
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

## SIGNATURE of Applicant or Assignee of Record

|           |   |           |              |
|-----------|---|-----------|--------------|
| Name      | Linda S. Stevenson  |           |              |
| Signature |  |           |              |
| Date      | May 29, 2003  | Telephone | 510-587-6000 |

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

Total of forms are submitted.

This collection of information is required by 37 CFR 1.36. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

SF 1463741 v1

**STATEMENT UNDER 37 CFR 3.73(b)**Applicant/Patent Owner: Carol J. LovattApplication No./Patent No.: 10/341,966Filed/Issue Date: January 13, 2002Entitled: NOVEL FORMULATION OF PHOSPHORUS FERTILIZER FOR PLANTSThe Regents of the University of California, a Non-Profit Organization

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1.  the assignee of the entire right, title, and interest; or
2.  an assignee of less than the entire right, title and interest.  
The extent (by, percentage) of its ownership interest is \_\_\_\_\_ %

in the patent application/patent identified above by virtue of either:

A.  An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 6970, Frame 0853, or for which a copy thereof is attached.

OR

B.  A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

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3. From: \_\_\_\_\_ To: \_\_\_\_\_  
The document was recorded in the United States Patent and Trademark Office at Reel \_\_\_\_\_, Frame \_\_\_\_\_, or for which a copy thereof is attached.

Additional documents in the chain of title are listed on a supplemental sheet.

Copies of assignments or other documents in the chain of title are attached.

(NOTE: A separate copy (i.e., the original assignment document or a true copy of the original document) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.8)

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

May 27, 2003

Date

Candace L. Voelker

Typed or printed name

Candace L. Voelker

Signature

Director, Agriculture & Biotechnology Licensing  
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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